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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/538,099 | 06/08/2005 | Klemens Brunner | NL 030920 | 6921 |
| 24737 7590 09/02/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510 | | | | |
| EXAMINER | | | | |
| YAMNITZKY, MARIE ROSE | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1794 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 09/02/2008 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/538,099

Applicant(s)

BRUNNER ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1794

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005 and 25 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 25 Sep 2006

1. The preliminary amendment filed June 08, 2005, which amends claims 3-8, 12 and 15, has been entered.

Claims 1-19 are pending.

2. The disclosure is objected to because of the following informalities:

Page 6, line 32, and page 12, line 32, contain text that is illegible.

The abstract also contains illegible text.

Appropriate correction is required.

3. Claims 13-15 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 13-15, 17 and 19: A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by “such as” and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the

decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claims 13, 17 and 19 recite the broad limitation “a ring system, monocyclic or polycyclic”, and these claims also recite “fused polycyclic, saturated or aromatic or combination thereof”, which is the narrower statement of the range/limitation. Claims 13, 17 and 19 recite the broad limitation “C₄-C₁₂ aryl”, and these claims also recite “phenyl”, which is the narrower statement of the range/limitation.

Claims 18 and 19 provide for the use of charge transporting conjugated donor but, since these claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

4. Claims 18 and 19 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2 and 4-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Ikehira et al. (US 2002/0193532 A1).

See the entire patent application publication. In particular, see Examples 3 and 6 (pages 33-35). Example 3 provides a polymeric light emitting substance that meets the limitations of the combination required for the device of present claims 1, 2 and 4-15, meets the limitations of the combination claimed in present claims 16 and 17, and meets the limitations of the combination used per present claims 18 and 19. The polymeric light emitting substance of Ikehira's Example 3 is used to make the electroluminescent device of Ikehira's Example 6.

The polymeric light emitting substance synthesized per Ikehira's Example 3 comprises N-octyl-3,6-carbazole units, 9,9-dioctyl-2,7-fluorene units, and units of an iridium phenylpyridine complex. This polymeric light emitting substance corresponds to a combination of a charge-transporting conjugated donor polymer/compound and a phosphorescent acceptor compound dispersed in the donor polymer/compound wherein the donor and acceptor are integrated to form one integrated donor-acceptor polymer as recited, for example, in present claims 12 and 15.

The N-octyl-3,6-carbazole units are structural units of the first formula in present claims 13, 17 and 19 wherein Y is a single bond and -X- is -NR¹- wherein R¹ is a C₈ alkyl. Each

carbazole unit comprises two phenylene sub-units wherein the path length of the shortest uninterrupted path of unsaturated atoms connecting the first and second radical sites is an odd integer as required by each of the present claims. The path length of said shortest uninterrupted path in the phenylene sub-units of the N-octyl-3,6-carbazole units is 1 as required by present claim 2, and the first and second radical sites in each of these phenylene sub-units are positioned relative to one another in a meta arrangement as required by present claim 9. The total number of unsaturated atoms in each of these odd-integer sub-units is 6, thus further meeting the limitations of present claim 6.

The only odd-integer conjugated multivalent radical sub-units in the polymer of Example 3 are the two phenylene sub-units of the N-octyl-3,6-carbazole units. Based on the identity of the other units in the polymer, the arrangement of conjugated units within the conjugated chain of the polymer inherently meets the limitations of present claim 4 regardless of the specific arrangement of the fluorene, carbazole and iridium complex units within the polymer.

The total number of unsaturated atoms of each of the conjugated units in the polymer of Example 3 that is not an odd-integer sub-unit is 6, thus further meeting the limitations of present claim 8.

The energy level requirements of present claims 5, 7, 10 and 11 are inherently met by Ikehira's Example 3 polymeric light emitting substance.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikehira et al. (US 2002/0193532 A1) as applied to claims 1, 2 and 4-19 above, and for the further reasons set forth below.

Ikehira's polymer of Example 3 contains fluorene units which provide more than one even-integer conjugated multivalent radical sub-unit, with at least two even-integer conjugated multivalent radical sub-units connected to one another in the conjugated chain. Accordingly, Ikehira's polymer of Example 3 does not meet the limitations recited in present claim 3. However, Ikehira's polymers are not required to comprise the fluorene units included in the polymer of Example 3.

The fluorene units of the Example 3 polymer have the structure represented by the second formula on page 12 of the prior art. Fluorene units having odd-integer conjugated multivalent radical sub-units, as provided by the structure represented by the third formula on page 12 of the prior art, may be used in place of the fluorene unit having even-integer sub-units, as well as other odd-integer units (such as those provided by the second, fifth, eighth or tenth formula on page 9). Utilizing an odd-integer unit in place of the fluorene units in the Example 3 polymer results in a polymer in which the only even-integer sub-units in the conjugated chain are those provided by the iridium complex, and which are capable of providing a polymer having the arrangement of even-integer units required by claim 3. Repeating units having a single even-integer conjugated

multivalent radical sub-unit are also disclosed that are capable of being incorporated into a conjugated chain in the arrangement required by present claim 3 (such as those provided by the first, third, fourth, sixth, seventh, ninth or eleventh formula on page 9). A repeating unit having a single even-integer unit can be utilized in place of the fluorene units in the Example 3 polymer to provide polymers meeting the limitations recited in present claim 3. As taught in paragraph [0093], the different repeating units of the polymer may have various arrangements within the polymer structure. Further, an intent of the prior art is to provide a polymer capable of exhibiting light emission from the triplet excited state of the metal complex. Guided by the teachings of the prior art, it would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine suitable and optimum combinations and arrangements of different repeating units taught in the prior art in order to provide a polymer capable of exhibiting light emission from the triplet excited state of the metal complex.

9. Claims 1-11, 13, 14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts et al. (US 2004/0062930 A1).

Roberts et al. disclose conjugated polymers having charge transporting properties, and teach mixing of a phosphorescent compound with the polymer. For example, see paragraphs [0006], [0056]-[0059], [0077]-[0089], [0113]-[0115], [0149]-[0161], [0352]-[0363] (Example 21), [0372]-[0373] (Example 25), and [0390]-[0395].

Roberts' polymers of Examples 21 and 25 are charge-transporting conjugated donor polymers/compounds having a conjugated chain including one or more odd-integer conjugated

multivalent radical sub-units as required by the present independent claims. In both of these polymers, the carbazole repeat unit, which is a structural unit of the first formula in present claims 13, 17 and 19 wherein Y is a single bond and -X- is -NR¹- wherein R¹ is a C₆ aryl, comprises two phenylene sub-units wherein the path length of the shortest uninterrupted path of unsaturated atoms connecting the first and second radical sites is an odd integer as required by each of the present claims. The path length of said shortest uninterrupted path in the phenylene sub-units of the carbazole repeat unit is 1 as required by present claim 2, and the first and second radical sites in each of these phenylene sub-units are positioned relative to one another in a meta arrangement as required by present claim 9. The total number of unsaturated atoms in each of these odd-integer sub-units is 6, thus further meeting the limitations of present claim 6.

Roberts' polymers of Examples 21 and 25 contain even-integer conjugated units and odd-integer conjugated units. The arrangement of conjugated units within the conjugated chain of the polymer of Example 21 meets the limitations recited in present claims 3 and 4. The arrangement of conjugated units within the conjugated chain of the polymer of Example 25 meets the limitations recited in claim 4. The total number of unsaturated atoms of each of the conjugated units in the polymers of Examples 21 and 25 that is not an odd-integer sub-unit is within the scope of present claim 8.

Roberts et al. provide examples of electroluminescent devices in which a phosphorescent acceptor compound is mixed with a polymer according to Roberts' invention. See [0390]-[0395] for a description of devices in which Ir(ppy)₃, (bthpy)₂Ir(acac) or Pt(OEP) is used in the light emitting layer of the device in combination with a polymer. The devices of these examples do

not use the polymer of Example 21 or Example 25, and no specific example of a device is provided in which one of these phosphorescent acceptor compounds (or any of the phosphorescent compounds suggested in paragraph [0161]) is used in combination with the polymer of Example 21 or Example 25. However, given Roberts' teachings, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to utilize a phosphorescent compound in combination with the polymer of Example 21 or Example 25 in order to provide an electroluminescent device similar to those described in paragraphs [0390]-[0395]. The energy level requirements recited in present claims 5 and 7 are inherently met by Roberts' polymers of Examples 21 and 25. The energy level requirements recited in present claims 10 and 11 are inherently met by any of Ir(ppy)₃, (bthpy)₂Ir(acac) or Pt(OEP) in combination with Roberts' polymer of Example 21 or 25.

10. With respect to the Information Disclosure Statement filed September 25, 2006, foreign patent document DE1022660 has not been considered by the examiner and is not made of record. This document is not in English, and the IDS does not include a concise explanation of the relevance of the document as required by 37 CFR 1.98(a)(3).

11. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

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The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

/Marie R. Yamnitzky/
Primary Examiner, Art Unit 1794

MRY
August 29, 2008